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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,336	10/28/2003	Peter J. Geiss	BUR920010184US2	4852

24241 7590 04/20/2005

IBM MICROELECTRONICS  
INTELLECTUAL PROPERTY LAW  
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972 E  
ESSEX JUNCTION, VT 05452

EXAMINER
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BEREZNY, NEMA O

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/695,336

Applicant(s)

GEISS ET AL.

Examiner

Nema O. Berezny

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 20-32 is/are pending in the application.
- 4a) Of the above claim(s) 27-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10282003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election without traverse of claims 20-26 in the reply filed on 2-7-05 is acknowledged. Claims 20-32 remain pending, with claims 27-32 withdrawn.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Anand et al. (4,559,696). Anand discloses a bipolar transistor comprising: a collector (Fig.3 el.14); a base (el.18); and a polysilicon emitter (el.20) containing a dopant species and a polysilicon grain size modulating species (col.4 lines 17-28), wherein Applicant discloses in instant specification that an ion implant of carbon will change the polysilicon grain size (p.7 line 17 – p.8 line 5) **[claim 20]**. Anand also discloses wherein said dopant species is arsenic (col.4 lines 17-28) **[claim 21]**; and wherein said polysilicon grain size modulating species is selected from the group consisting of antimony and carbon (col.4 lines 17-28) **[claim 22]**.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 23-24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anand as applied to claim 20 above, and further in view of Candelaria (5,360,986). Anand does not disclose a higher or lower base current and a higher or lower emitter resistance using the grain size modulating species, or a specific ion implant dosage and energy. However, Anand would look to one such as Candelaria for improved device performance and higher emitter efficiency because Candelaria discloses wherein the base current of said bipolar transistor is higher or lower than the base current of an identical bipolar transistor fabricated without said polysilicon grain size modulating ion implantation step (col.2 lines 58-66; col.4 line 63 – col.5 line 3); and wherein the resistance of said emitter of said bipolar transistor is higher or lower than the emitter resistance of an identical bipolar transistor fabricated without said polysilicon grain size modulating species ion implantation step (col.2 lines 58-66; col.4 line 63 – col.5 line 3). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the base current and emitter resistance modulating species of Candelaria with the transistor of Anand in order to improve the device performance (col.2 lines 58-66; col.4 line 63 – col.5 line 3) **[claims 23, 24]**.

Candelaria also discloses wherein said dopant species is arsenic and is implanted into said polysilicon emitter at a dose of  $1E15$  to  $2.3E16$  atm/cm<sup>2</sup> and at an energy of about 40 to 70 Kev (col.3 lines 57-61), and wherein said polysilicon grain size modulating species is carbon and is implanted into said polysilicon emitter at a dose of  $1E14$  to  $1E16$  atm/cm<sup>2</sup> and at an energy of 15 to 35 Kev (col.3 lines 38-42). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the dosage and energy for the modulating species of Candelaria with the transistor of Anand in order to provide higher emitter efficiency (col.4 line 63 – col.5 line 3) **[claim 26]**.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anand as applied to claim 20 above, and further in view of Yamazaki (2002/0145167). Anand does not disclose a dosage or energy for the implantation of arsenic or antimony in the emitter. However, Anand would look to one such as Yamazaki for a higher voltage breakdown because Yamazaki discloses wherein said dopant species is arsenic and is implanted into said polysilicon emitter at a dose of  $1E15$  to  $2.3E16$  atm/cm<sup>2</sup> and at an energy of about 40 to 70 Kev, and wherein said polysilicon grain size modulating species is antimony and is implanted into said polysilicon emitter at a dose of  $1E15$  to  $1.5E16$  atm/cm<sup>2</sup> and at an energy of about 30 to 70 Kev (p.3 para.31,33). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the dosage and energy for the implantations of Yamazaki with the transistor of Anand in order to provide a higher voltage breakdown (p.3 para.33).


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nema O. Berezny whose telephone number is (571) 272-1686. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NB

  
CRAIG A. THOMPSON  
PRIMARY EXAMINER